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Money and Credit in the Monetary Transmission Process

By Karl Brunner and Allan H. Meltzer*

The title of this session asks about the roles of money or credit in the transmission of monetary and real shocks. Our answer, repeated in different forms for more than two decades, is that the analysis of the transmission process is incomplete without both the money and credit markets and their interaction.

For many years, economists ignored the role of the credit markets. Recently, there has been some change. Concerns about financial fragility, banking failures, debt default and loan rationing focused attention on credit markets. Reexamination of experience during the early 1930's (Ben Bernanke, 1983) raises an issue about whether credit market shocks operated 1) as an independent, or exogenous, impulse supplementing and reinforcing the monetary decline, or 2) as part of the interaction of credit, money (and other financial) markets.

Standard macroeconomic analyses, represented by the IS/LM system, cannot cope with these issues. The IS/LM system is restricted to a single portfolio equation representing all asset markets, so it cannot recognize the operation of an independent credit market. Consequently, the discussion of problems associated with the credit market typically proceeds outside the major macroeconomic paradigm. This can be seen in the work of Benjamin Friedman (1983), Joseph Stiglitz and Andrew Weiss (1981) and Bernanke. Their discussions and empirical work rely on ad hoc constructions and arguments not integrated into a broader macroeconomic scheme. The failure of integration reflects a judgment about the relevance of the dominant paradigm for analysis of the transmission of shocks from the credit market to the real economy and conversely.

This paper briefly considers three issues. First, we summarize our view of the interrelation of credit, money, and output markets. Then, we discuss some issues about banking and debt crises in the Great Depression discussed in Bernanke. Finally, we consider whether loan and equity rationing are a central feature of the transmission of monetary impulses, particularly deflationary impulses, as suggested by Stiglitz and Weiss, and by Stiglitz (1987).

I. Money and Credit

The basic problem of the IS/LM framework follows from the implicit assumptions about asset substitution made to fit the world into a framework admitting only two assets (see Brunner, 1971; our papers, 1987; 1988). The analysis proceeds in one of two ways. Either money is a substitute only for financial assets ("bonds"), or there is general substitution over all assets. A two-asset world is achieved in the latter case by making financial and real assets perfect substitutes, or by restricting the analysis to episodes with comparatively small relative changes in the market conditions for financial and real assets. Consequently, the IS/LM framework is either empirically falsified or it fails to offer a useful explanation of major events. To study the interaction between money, financial assets, and real assets, we require a more inclusive analysis which explicitly incorporates a second asset market. The joint determination of bank credit, money stock, interest rate, and the price level of real assets may be achieved in this way.

The extended analysis supplements the money-market equation with an equation describing the credit market. The two-asset markets interact with the output market. Monetary impulses are conveyed by a process of general substitution driven by changes in relative prices 1) of various assets, 2) of

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real assets and their services, and 3) of assets and output. This process extends the links between monetary impulses and the output market substantially beyond the narrow channel recognized in the IS/LM framework. In the extended model, impulses are conveyed simultaneously by a “Keynesian” channel (i.e., adjustments of interest rates on financial assets), and also by adjustments of the price level of real assets. The pattern of transmission depends, among other things, on the public’s perception about the durability and persistence of various shocks. As shown most recently in our paper (1988), the analysis can be readily extended to include a wide range of intermediaries.

The interaction of the money market with a credit market modifies the results derived from the IS/LM model in several ways. First, IS/LM analysis of the transmission process necessarily emphasizes the magnitude of the interest elasticity of the demand for money. Interaction with the credit market changes this result. The relative magnitude of the interest elasticities on the two-asset markets, irrespective of their absolute value, determines the transmission of shocks by means of asset price adjustments. Second, the IS/LM model implies that an interest target policy effectively isolates output from shocks to money demand. This proposition is denied once we incorporate a credit market and admit credit market shocks. A strategy of monetary control achieves better results in response to credit market shocks than a strategy of interest control. Third, the effects of credit market shocks may differ in sign and magnitude from the effects produced by money market shocks. Fourth, the idea of a liquidity trap, suspending all connection from the money market to the output market, is firmly anchored in the structure of the IS/LM system. This idea is untenable once we include interaction with a credit market. Fifth, changes in reserve requirements if fully offset by open market operations impose no adjustments on asset markets and output market in an IS/LM analysis. The extended analysis shows that compensated changes in reserve requirements modify conditions on the credit market and thus induce adjustments in the asset markets. Finally, the extended analysis offers a better framework for analyzing problems posed by regulation and deregulation.

Our summary reveals an important fact. In our analysis, the transmission of impulses (or shocks) to output depends on the operation and properties of the credit market. This holds both for monetary and real shocks, say, due to variations in the expected net return on real assets. An entirely separate, but related, issue is whether credit market shocks are an independent disturbance, as in Bernanke’s discussion of the 1930’s, or part of the process transmitting real and monetary shocks.

II. Banking Crises

Bernanke reconsiders the role of banking crises in the propagation of depressions. Such crises are immediately reflected by a run on banks expressed by an increase in the ratio of currency to deposits. In the money-credit market analysis, the rise in the currency ratio lowers both the volume of bank credit and the money stock. Bank credit responds with greater sensitivity than the money stock. The reason is that the asset multiplier, linking the monetary base with bank credit, responds more sensitively to variations in the currency ratio than does the monetary multiplier (linking the base with the money stock). The effects on the asset markets are transmitted to the output market. Bernanke emphasizes correctly that these adjustments lower the degree of financial intermediation. Transaction and information costs of financial operations increase. The network of credit shrinks, and aggregate real demand for output and monetary velocity decline.

This account is incomplete. The run on banks and the resulting banking crisis would be avoided if the monetary authorities function as “lender of last resort.” Their failure to do so raises the marginal productivity of the banks’ reserve position, further reducing asset and monetary multipliers. Bank credit and money stock suffer a further reduction with corresponding repercussions on the output market. An unchecked run produces,
with some probability, bankruptcies and closures of banks. The probability of a run rises in the absence of a lender of last resort; the total demand for reserves exceeds the outstanding stock. Interest rates rise and asset prices fall, lowering asset values. The money stock and bank credit contract further. Initially, nonbank lenders may partially substitute, at rapidly rising marginal cost, for the decline in bank credit, but the net effect will be dominated by the decline in bank credit and disintermediation.

The financial crisis, revealed by bankruptcies and closures, has further consequences. It generates a large and pervasive uncertainty. This lowers the expected net real return on real assets. The decline in expected net real returns affects both asset and output markets. The adjustment imposed on asset markets and the interaction of asset and output markets reinforce the direct effect of bankruptcies and uncertainty on the output market.

This account of banking crises shows that their consequences depend on the working of a credit market and its interrelation with a money market. The credit market plays a major role in the conversion of the initial run on banks, via bankruptcies and bank closures, into a major deflationary process and, with the failure of the lender of last resort, into a possible banking crisis.

A question of interpretation remains. Are runs on banks the result of a cyclic decline or a consequence of monetary retardation? A comparison between the United Kingdom and the United States is informative. This comparison suggests that the observed differences in the two countries depend on the central bank's commitment to act as a lender of last resort and on the nature of the banking structure. An understanding by the banks and the public that the central bank accepts such a commitment moderates fears and uncertainties and avoids the subsequent banking crisis. In the United Kingdom after 1866, the central bank functioned as lender of last resort. There were no banking crises (see also Anna Schwartz, 1987). There was no central bank in the United States before 1914. The Federal Reserve refused in 1930–1933 to honor the commitment to serve as a lender of last resort. Further, the repetitive occurrence of banking crises in the United States suggests that crises may be conditioned by the magnitude and virulence of the downswing.

We conclude that runs on banks and banking crises are endogenous events, conditional on the monetary propagation mechanism. The relevant conditions include the operation of a central bank, the structure of the banking system and the magnitude of the recession. Phillip Cagan's (1965) observation that banking crises typically occur late in the cycle and not at the beginning of the downswing offers some support for our conjecture. It follows under the circumstances that monetary policy, understood as a choice of institutions characterizing central banks and banking, shapes the likelihood and the pattern of potential banking crises.

Bernanke introduces the debt crisis as a separate and independent phenomenon, in addition to the banking crisis. He presents an impressive array of facts revealing the depth and pervasiveness of the debt crisis during the Great Depression. The transmission of the monetary retardation initiated in 1929, amplified by the banking crises appearing in the 1930's, lowered the price level of output and, even more, the price level of real assets. This massive deflation occurred in the context of an extensive network of private debt accumulated during the 1920's. The net worth position of households and business firms fell. Given the distribution of debtor positions, the deflationary process necessarily increased the number of bankruptcies, lowering the net worth of creditors and accelerating the debt crisis fostered by falling prices (and incomes). The risk premium on many assets rose, further reducing prices on real assets. (Interest rates on (default) risk-free securities declined due to an allocational shift from real assets to such securities.) These adjustments, unleashed on the asset markets, reinforced the direct effect of monetary contraction on the aggregate real demand for output.

Our discussion makes clear that we accept Bernanke's emphasis on the role of the debt crisis as an important component of the propagation mechanism. We do not accept
Bernanke's analysis of the debt crisis as a separate and independent exogenous shock. Once the monetary authorities allow the emergence of a major deflation of asset and output price levels, in a system with many holders of nominally fixed debt, a debt crisis is an induced response to the deflation. A minor debt crisis occurred in the United States early in the 1980's mainly as a result of a lower, positive rate of inflation.

This account, explicitly acknowledging the role of debt and credit in the propagation of major depressions, removes an objection to the monetary explanation of the Great Depression. The observation that real balances rose and velocity fell during the early 1930’s is said to disconfirm the thesis of a (possible partial) monetary shock. The banking and debt crisis, unleashed in the propagation of such a shock through the economy under prevailing monetary arrangements, explains the emergence of the relatively large decline in velocity. This, in turn, explains why the deflation and decline are disproportionately large relative to the decline in the money stock. The secondary and tertiary effects of the monetary retardation, transmitted through the money-credit process and augmented by the failure of the lender of last resort, magnified the response to the monetary decline and induced an endogenous flight to money large enough to raise real cash balances. Despite the rise in real balances, however, real wealth fell. The effect of an increase in real balances on net worth (emphasized in the Pigou effect) was overwhelmed by the debt problem and the fall in the real value of real assets.

Bernanke draws an important policy conclusion from the destructive effects of the debt crisis. Since he views the debt crisis as an exogenous event, he argues for selective bailouts of bankrupt firms. We find this proposal ill-advised and unnecessary. It is ill-advised because it disregards the serious moral hazard associated with such a policy and the incentives it creates in the political process. It is unnecessary, we believe, because the debt crisis, like the banking crisis, is avoidable if the monetary authority prevents severe price deflation. By preventing deflation, the monetary authority prevents the destructive effect of the money-credit decline and the wave of bankruptcies. We conclude that banking crises and debt crises can be prevented with the aid of a suitable choice of monetary arrangements.

III. Loan Rationing

All shocks operating on the economy induce adjustments in portfolios and impose changes in relative asset prices. These changes in relative prices are part of a general substitution process affecting all assets and liabilities. This process transmits the asset markets responses to the output market, reinforcing or moderating any direct effects of the shocks to the output market. In particular, monetary impulses are transmitted to the output market via the general substitution process and resulting relative price changes.

Stiglitz, in a number of papers, seems to contest this analysis. He assigns a central place in the transmission of monetary impulses to loan rationing. This assignment is supported with the observation that variations of the real rate of interest remain comparatively small over the course of a business cycle. Changes in real rates appear to be insufficient and inadequate as a conduit of monetary impulses. Loan-rationing offers, on the other hand, a powerful, if somewhat asymmetric, conduit, since contractive monetary impulses are more reliably transmitted than expansive impulses.

The objections advanced by Stiglitz and others may be relevant in the context of the IS/LM framework, particularly when interest rates are interpreted as borrowing costs. The situation changes, however, when the transmission mechanism includes a spectrum of assets and liabilities. The magnitude of changes in interest rates observed over cycles is sufficient to produce substantial changes in asset prices. Indeed, a major issue in contemporary finance is whether asset prices fluctuate more than can be explained with current models of asset prices (Robert Shiller, 1981). The (impressionistically) moderate movement of interest rates cannot establish that the general substitution process, involving relative prices of real and financial
assets, cannot explain the observed adjustments.

The problem vanished in a multi-asset model. The extended asset market analysis summarized in our papers (1987; 1988) implies that the transmission of monetary impulses via non-Keynesian channels may strengthen under conditions which weaken the "Keynesian channel." Stiglitz's objection reflects the basic inadequacy of an IS/LM analysis which neglects a credit market and its interaction with a money market.

Our critique is addressed to the analysis presented by Stiglitz and his coauthors. It does not affect the relevance of the phenomenon addressed under the label of "loan rationing." The phenomenon would not arise in a Walrasian world with full (or nearly full) information. Loan rationing arises in a world of uncertainty, a world with transaction costs and costs of information.

Banks post a loan rate applicable to lowest-rate customers with small transaction costs. This prime rate is supplemented with an internal schedule specifying a range of loan rates for higher-risk classes and customers with higher transaction costs.

Consider the situation confronting a bank which sets a prime rate reflecting its assessment of market conditions expressed by a range of market interest rates. Every loan application involves risk, potential information, and transaction costs. Investment in information may lower the risk. Risk premiums, information and transaction costs, however, reduce the net loan rate received by the bank below the scheduled loan rate paid by the borrower. The net loan rate guides the bank's decision and the scheduled rate the borrower's decision. The wedge between scheduled and net loan rate is not constant. Applicants with highly uncertain repayment, large information costs required to lower the risk, and potentially large transaction costs are rejected. The expected net loan rate is too uncertain and too low compared to relevant opportunity costs. Moreover, under such circumstances, raising the scheduled rate may raise the implicit risk premium even further. Under pronounced uncertainty, raising loan rates may not be a solution to the bank's problem. A deliberate selection of loans can solve the bank's allocation problem. Loan applications with expected net real return at least equal to alternative return opportunities are selected for servicing by the bank.

Our analysis implies that the widespread custom of interpreting "nonprice rationing" as a sign of market failure is misconceived. Reliance on allocational mechanisms other than explicit prices characterizes many markets in which uncertainty about major aspects of the relevant product or service has a large role. Loan rationing is one such mechanism. It is not the central arch of the monetary transmission mechanism, as Stiglitz suggests. Once we move beyond the IS/LM analysis by incorporating a credit market and introducing a general substitution process, loan rationing supplements interest rate rationing, and other responses to relative price changes, as part of the monetary transmission process.

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